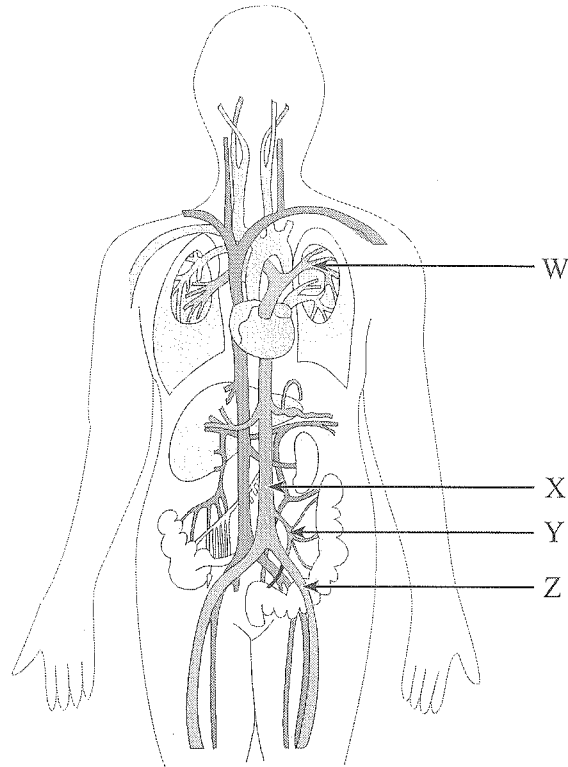


J, K: Heart + Circulation

Use the following diagram to answer question 1.



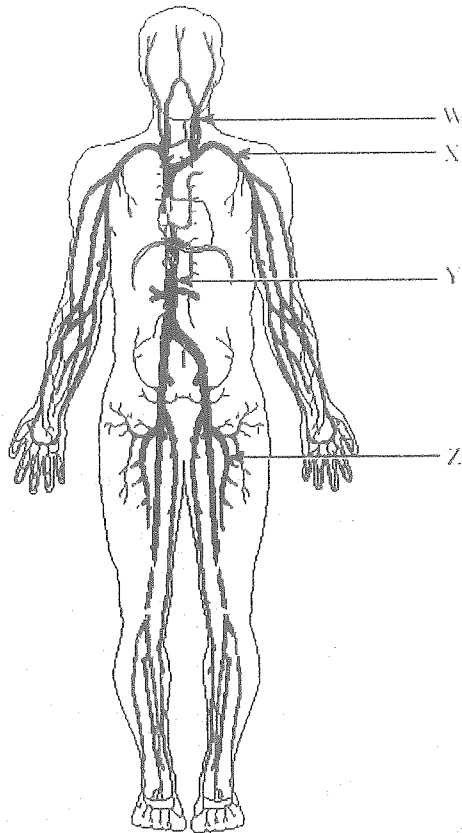
1. Which of the following indicates an iliac artery?

- A. W
- B. X
- C. Y
- D. Z

2. Which of the following correctly describes the level of oxygen in the blood of each chamber of the heart?

	Right Atrium	Left Atrium	Right Ventricle	Left Ventricle
A.	low	low	low	low
B.	low	low	high	high
C.	low	high	low	high
D.	high	low	high	low

Use the following diagram to answer question 3.



3. Which of the blood vessels indicated in the diagram above is the subclavian vein?

- A. W
- B. X
- C. Y
- D. Z

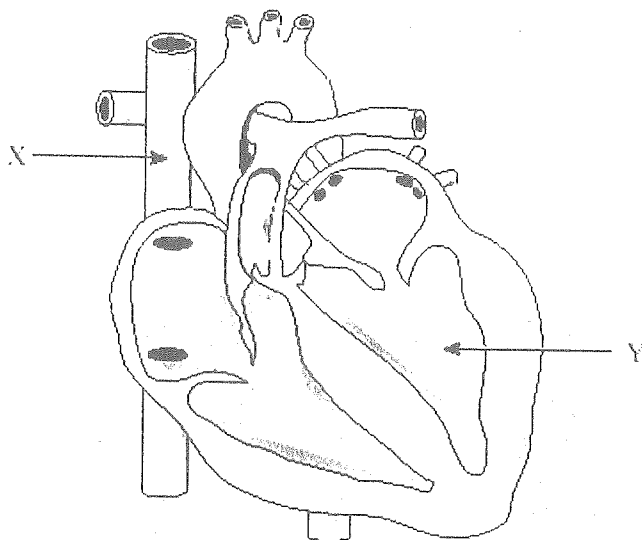
4. Which of the following is **not** found in the lymphatic system?

- A. Veins.
- B. Nodes.
- C. Arteries.
- D. Capillaries.

5. Red blood cells originate in the

- A. liver.
- B. lymph nodes.
- C. bone marrow.
- D. capillary beds.

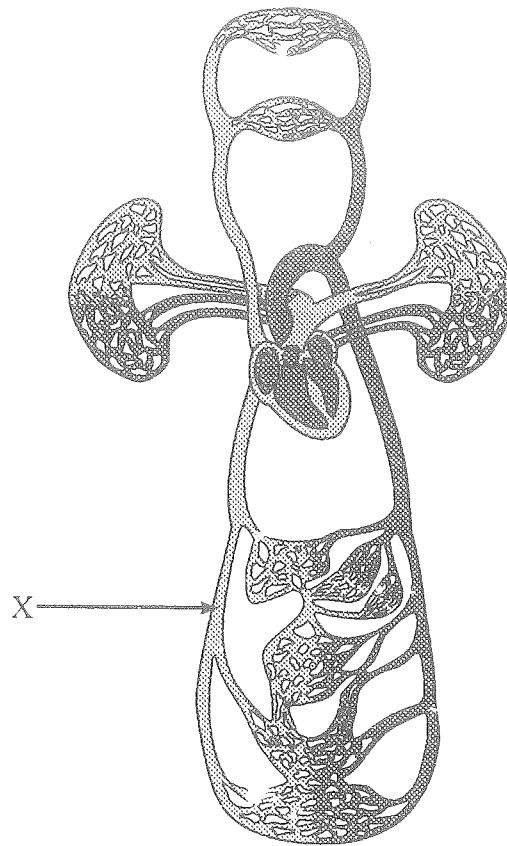
Use the following diagram to answer question 6.



6. The structures labelled X and Y in the diagram above are the

- A. aorta and the left ventricle.
- B. pulmonary trunk and the right ventricle.
- C. anterior vena cava and the left ventricle.
- D. anterior vena cava and the right ventricle.

Use the following diagram to answer question 7.



7. The blood vessel labelled X is called the

- A. subclavian vein.
- B. mesenteric artery.
- C. anterior vena cava.
- D. posterior vena cava.

8. A red blood cell leaves the aorta, makes a circuit through the body and arrives back in the capillaries of the alveoli. The correct sequence of organs through which the cell may have travelled is

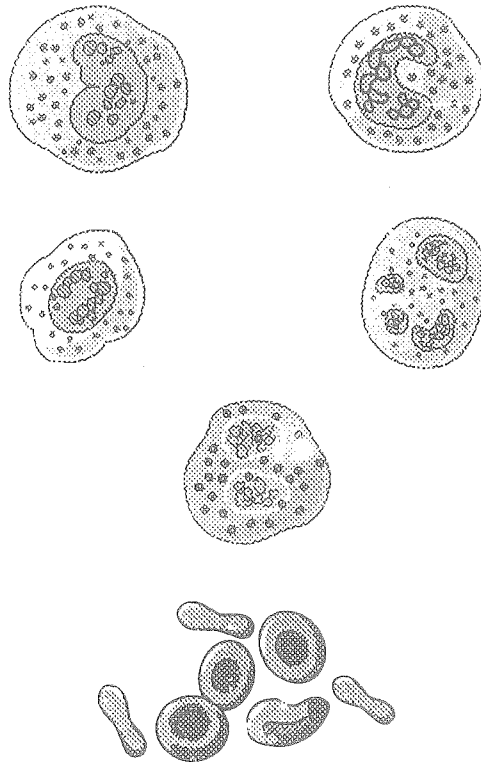
- A. lungs, heart, small intestine, liver.
- B. small intestine, heart, liver, lungs.
- C. liver, lungs, small intestine, heart.
- D. small intestine, liver, heart, lungs.

9. The coronary arteries carry

- A. blood to the aorta.
- B. nutrients to the heart cells.
- C. oxygenated blood to the head.
- D. deoxygenated blood to the lungs.

10. Rapid production of lymphocytes in the lymph nodes would indicate the presence of
- A. an infection.
 - B. hypotension.
 - C. hypertension.
 - D. capillary fluid exchange.

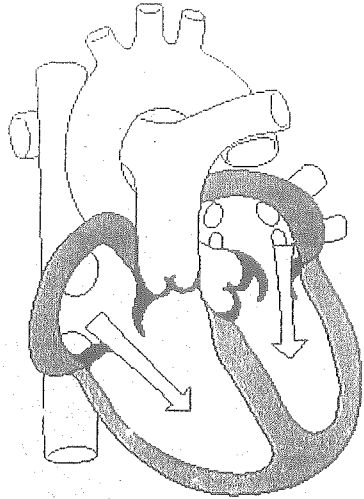
Use the following diagram to answer question 11.



11. The blood cells shown in the diagram would **not** be able to
- A. carry oxygen.
 - B. fight infection.
 - C. initiate a blood clot.
 - D. carry carbon dioxide.

12. The coordinating structure responsible for an intrinsic heart beat is the
- A. cerebellum.
 - B. sinoatrial node.
 - C. chordae tendineae.
 - D. sympathetic nervous system.

Use the following diagram to answer question 13.



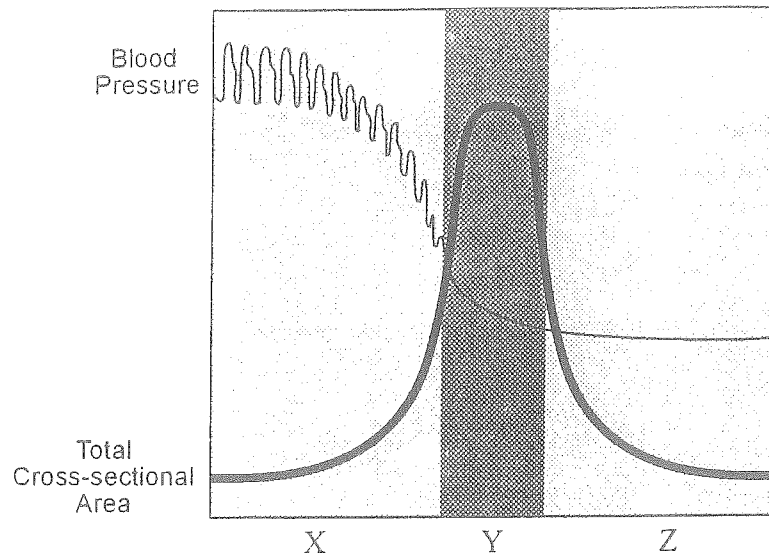
13. The diagram represents what happens in the heart as a result of
- systole of the atria.
 - systole of the ventricles.
 - the opening of the semi-lunar valves.
 - the sino-atrial (SA) node not functioning.

Use the following information to answer question

- Systole of the ventricles.
- Opening of the atrio-ventricular valves.
- Electrical impulse sent from the SA node.
- Atria fill with blood.

14. The order in which the events above occur during one heartbeat (the cardiac cycle) is
- 2, 1, 3, 4
 - 2, 3, 4, 1
 - 4, 1, 3, 2
 - 4, 3, 2, 1

Use the following graph to answer question 15.



15. The graph shows blood pressure and cross-sectional area of vessels in various parts of the circulatory system. What kind of blood vessel would have the characteristics found in area Z?
- Vein
 - Artery
 - Arteriole
 - Capillary

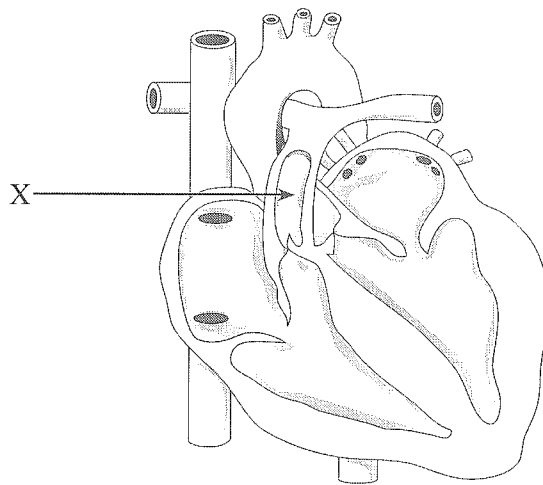
16. Blood pressure will be at its highest when

- A. atria relaxes.
- B. atria contracts.
- C. ventricles relax.
- D. ventricles contract.

17. A foreign substance entering the circulatory system is called a(n)

- A. platelet.
- B. antigen.
- C. antibody.
- D. hormone.

Use the following diagram to answer question 18.



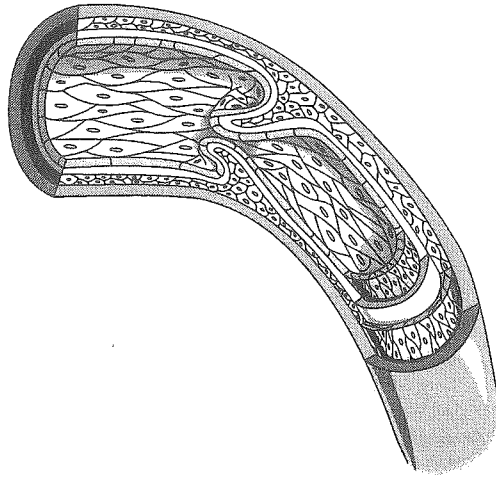
18. The blood vessel labelled X carries high levels of

- A. oxyhemoglobin toward the heart.
- B. oxyhemoglobin away from the heart.
- C. reduced hemoglobin toward the heart.
- D. reduced hemoglobin away from the heart.

19. Which of the following has the greatest **total** cross-sectional area of blood vessels?

- A. capillaries
- B. venous system
- C. arterial system
- D. pulmonary system

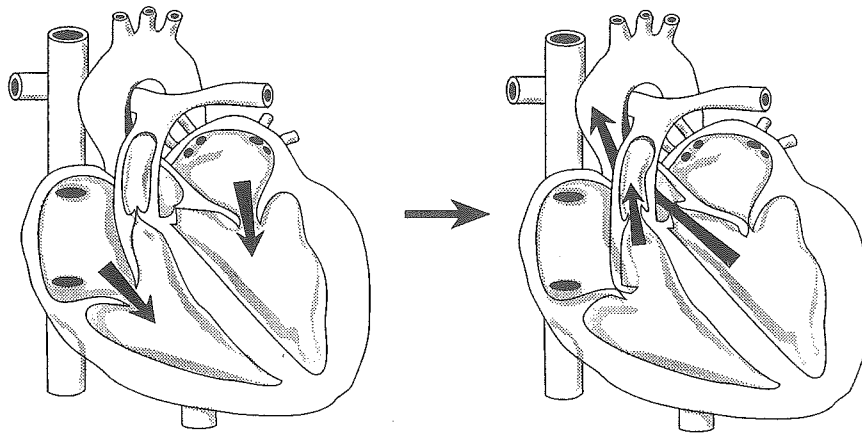
Use the following diagram to answer question 20.



20. The blood vessel shown in the diagram is classified as

- A. a vein.
- B. an artery.
- C. a capillary.
- D. an arteriole.

Use the following diagrams to answer question 21.



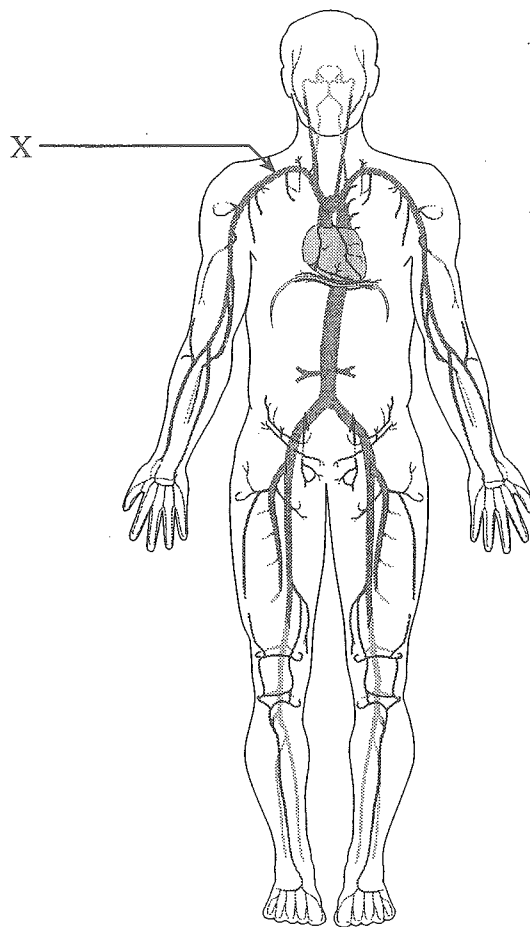
21. The stages in the cardiac cycle shown by the diagrams are

- A. atrial systole followed by ventricular systole.
- B. atrial systole followed by ventricular diastole.
- C. atrial diastole followed by ventricular systole.
- D. atrial diastole followed by ventricular diastole.

22. Which of the following structures prevents viruses from attaching to host cells?

- A. platelets
- B. antigens
- C. antibodies
- D. lymph nodes

Use the following diagram to answer question 23.



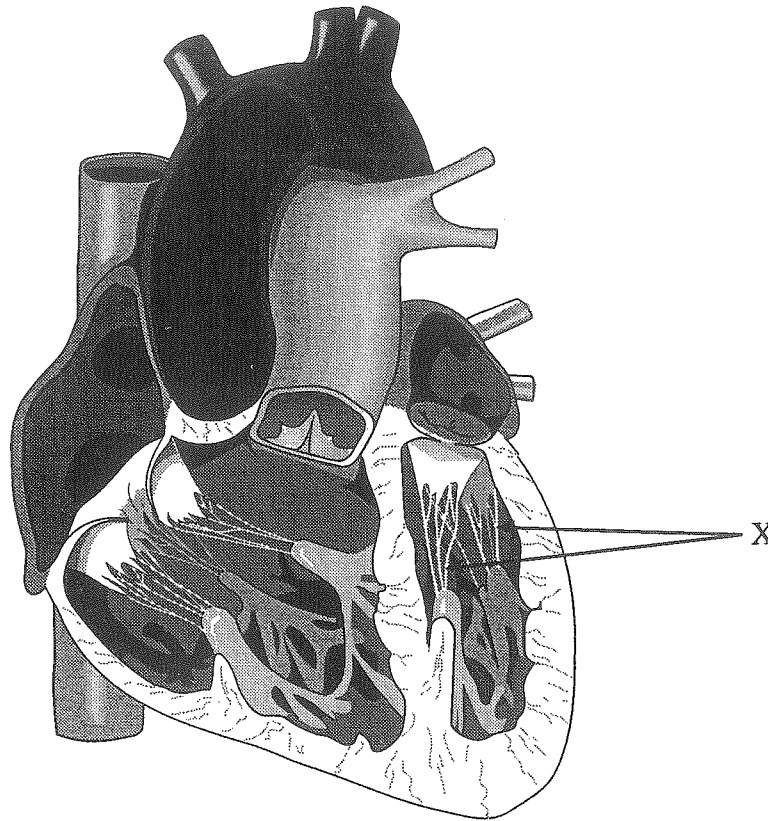
23. The artery labelled X is the

- A. aorta.
- B. carotid.
- C. coronary.
- D. subclavian.

24. A blood clot forms in the hepatic vein but breaks off and lodges in the next capillary bed it encounters. Where would it be found?

- A. liver
- B. brain
- C. lungs
- D. small intestine

Use the following diagram to answer question 25.

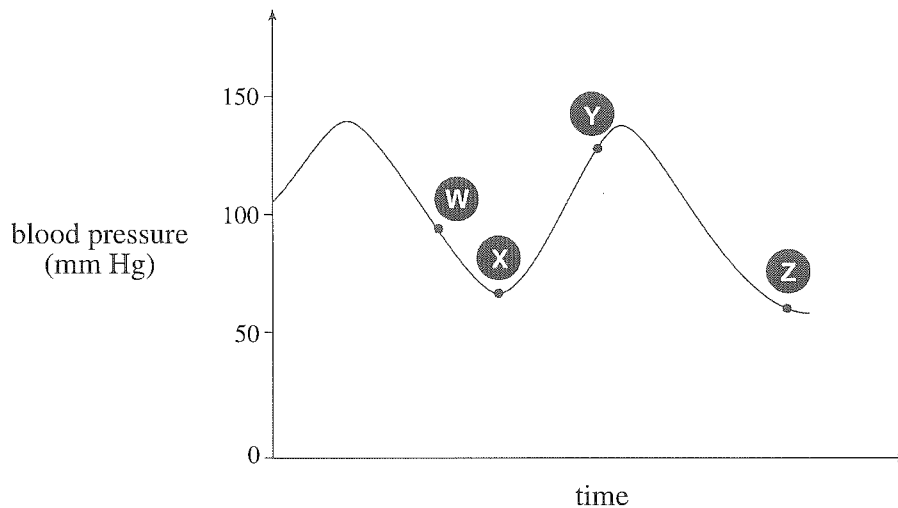


25. The function of structure X is to
- A. initiate the atrial contraction.
 - B. act as the pacemaker of the heart.
 - C. prevent the atrioventricular (AV) valve from inverting.
 - D. open the atrioventricular (AV) valve when stimulated by an electrical impulse.
26. One factor that can cause edema, an abnormal accumulation of fluid within tissues, is a decrease in
- A. blood pressure.
 - B. the secretion of ADH.
 - C. concentration of plasma proteins.
 - D. water reabsorption by the kidneys.
27. Internal respiration is the
- A. production of ATP in cells.
 - B. movement of air into and out of the lungs.
 - C. exchange of gases between the blood and the air.
 - D. exchange of gases between the blood and the tissues.

28. The structure that prevents blood from moving back into the left ventricle is the

- A. cardiac sphincter.
- B. chordae tendineae.
- C. atrioventricular valve.
- D. aortic semilunar valve.

Use the following graph to answer question 29.



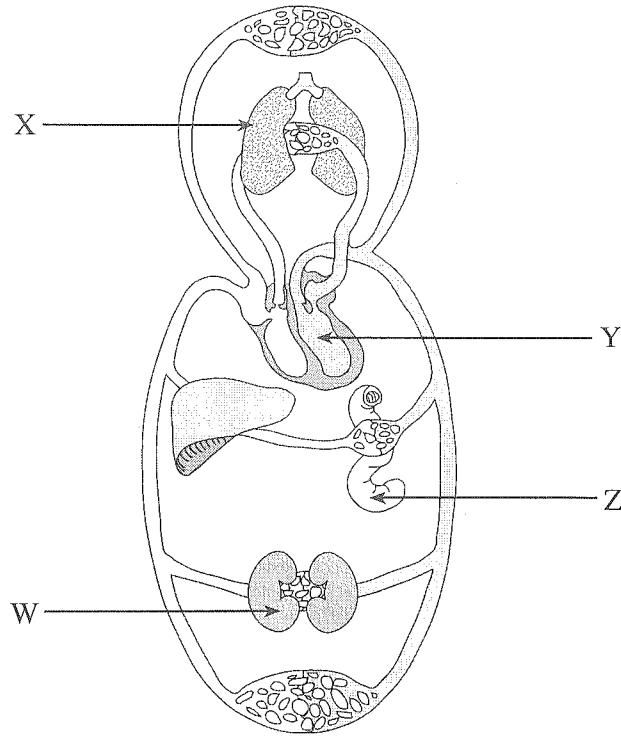
29. The graph shows changes in blood pressure in the aorta over time. Which letter would indicate when ventricular systole is occurring?

- A. W
- B. X
- C. Y
- D. Z

30. A person's blood pressure rose from 120/80 to 160/100 during a stressful situation. This change in blood pressure was caused by a hormone released from the

- A. thalamus.
- B. thyroid gland.
- C. adrenal gland.
- D. corpus callosum.

Use the following diagram to answer questions 31 and 32.



31. Which arteries bring blood to structure Z?

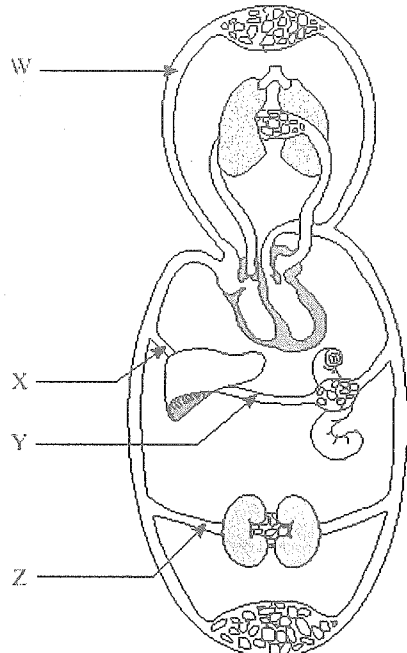
- A. hepatic
- B. iliac
- C. mesenteric
- D. renal

32. Blood flowing through the hepatic vein is obstructed. As a result, the blood pressure increases in the organs drained by the hepatic portal vein. Which of the following organs would be affected?

- A. W
- B. X
- C. Y
- D. Z

33. A red blood cell is located in an artery in your right arm. How many capillary beds must this cell pass through before it is returned to the left ventricle?
- A. one
 - B. two
 - C. three
 - D. four
34. The function of the nodes in the lymphatic system is to
- A. filter debris.
 - B. produce platelets for clotting.
 - C. break down worn-out red blood cells.
 - D. help maintain a constant blood pressure.
35. What occurs when an antigen enters the body?
- A. There is increased platelet production.
 - B. Red blood cells phagocytize the antigen.
 - C. Antibodies change shape to fit the antigen.
 - D. Specific antibodies are produced and released.
36. An irregular heartbeat where contraction of the atria does **not** always result in contraction of the ventricles, likely indicates a problem with the
- A. SA node.
 - B. AV node.
 - C. AV valve.
 - D. semi-lunar valve.
37. An increase in which of the following would cause hypotension?
- A. heart rate
 - B. cardiac output
 - C. arteriole dilation
 - D. reabsorption of water by the kidneys
38. Initiation of the cardiac cycle is dependent on the
- A. sinoatrial (SA) node.
 - B. sympathetic nervous system.
 - C. parasympathetic nervous system.
 - D. nerve impulses from the cerebrum.

Use the following diagram to answer question 39.



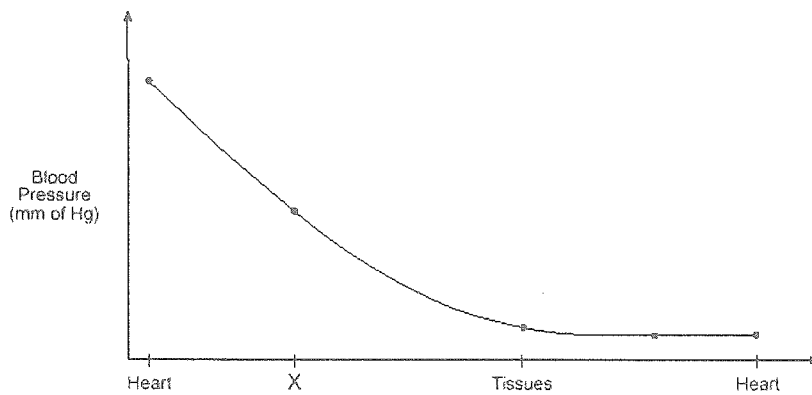
39. Which letter indicates a portal vein?

- A. W
- B. X
- C. Y

40. Oxygen is delivered to the heart muscle by the

- A. aorta.
- B. carotid artery.
- C. coronary artery.
- D. pulmonary artery.

41. A person's blood pressure was measured at five blood vessels and plotted on the graph below.



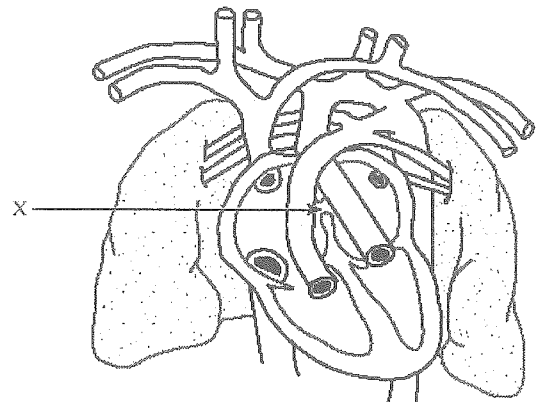
The reading taken at X would be at the

- A. renal artery.
- B. pulmonary vein.
- C. posterior vena cava.
- D. peritubular capillaries.

42. In the fetus, the function of the structure labelled X is to

- A. take blood to the lungs.
- B. ensure adequate blood flow to the brain.
- C. return blood from the placenta to the heart.
- D. direct some of the blood away from the lungs.

Use the following diagram to answer question 42.



43. Blood capillaries and lymph capillaries both
- filter bacteria.
 - have one-way valves.
 - contain red blood cells.
 - have walls which are one-cell thick.

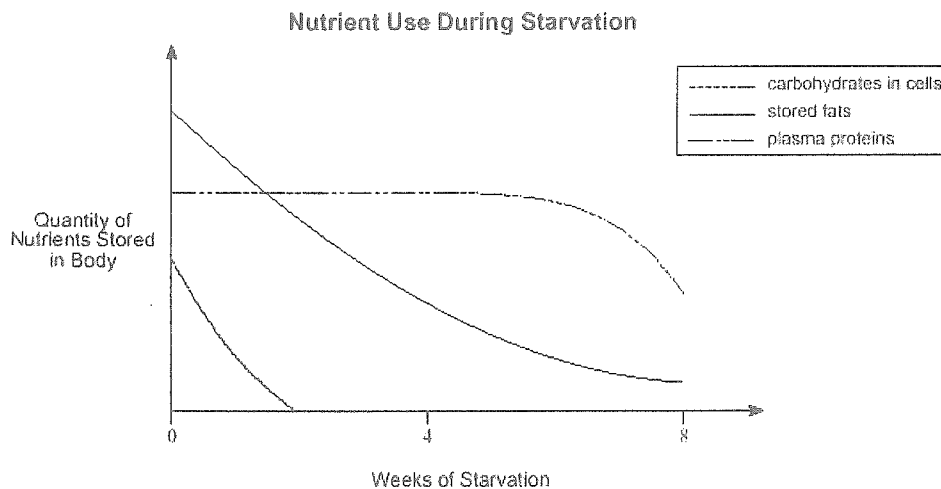
Use the following information to answer question 44.

- transport gases
- maintain body temperature
- protect the body against blood loss
- produce hormones that stimulate metabolism
- carry digestive enzymes to the small intestine

44. How many of the above are functions of the blood?
- two
 - three
 - four
 - five

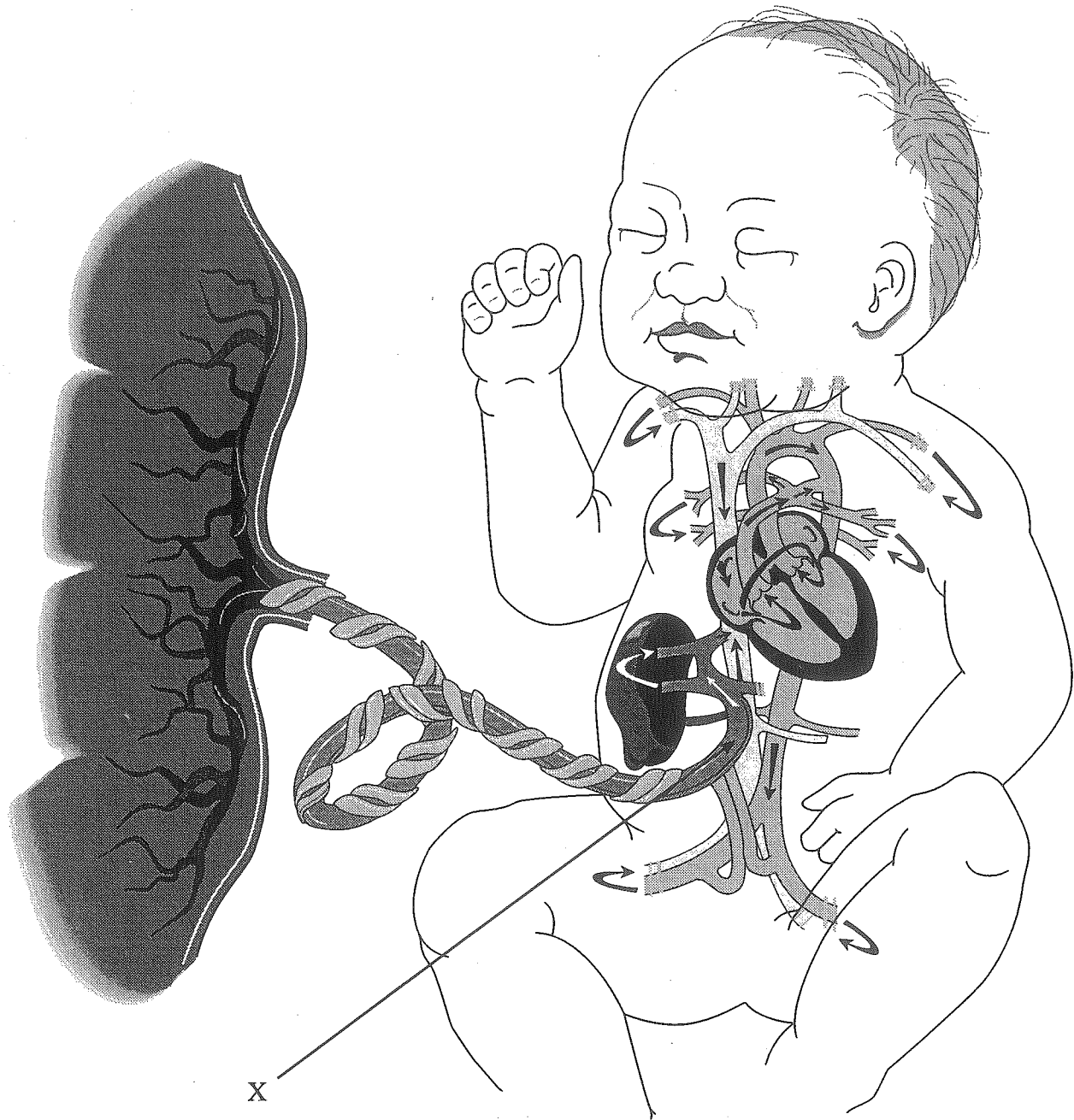
45. Which of the following correctly matches structure with function?
- platelets — provide immunity
 - plasma proteins — carry oxygen
 - red blood cells — carry carbon dioxide
 - white blood cells — initiate blood clotting

Use the following graph to answer question 46.



46. The graph illustrates how the body consumes stored nutrients during a prolonged period of starvation. After eight weeks,
- blood pressure will increase.
 - fluids will accumulate in tissues.
 - glycogen production will increase.
 - hemoglobin will not release oxygen.

Use the following diagram to answer question 47.



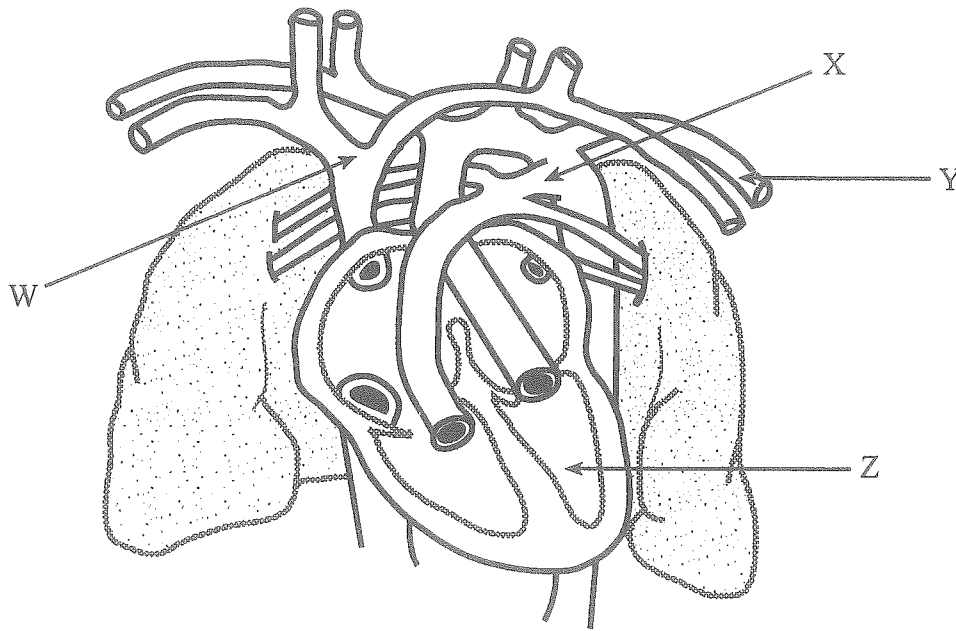
47. The blood vessel found in adults that contains oxygen levels similar to the blood vessel labelled X is the

- A. renal vein.
- B. pulmonary vein.
- C. pulmonary artery.
- D. hepatic portal vein.

48. Lymph enters the circulatory system at the

- A. jugular vein.
- B. umbilical vein.
- C. subclavian vein.
- D. pulmonary vein.

Use the following diagram to answer question 49.



49. Which arrow indicates a structure present in fetal, but not adult circulation?

- A. W
- B. X
- C. Y
- D. Z

50. All of the following are components of plasma **except**

- A. salts.
- B. water.
- C. proteins.
- D. platelets.

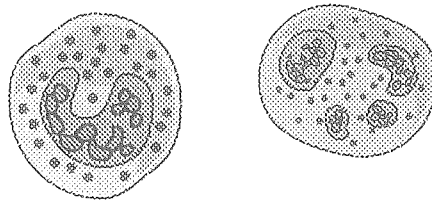
Use the following table to answer question 51.

VESSEL	RED BLOOD CELLS	VALVES
W	absent	absent
X	present	present
Y	absent	present
Z	present	absent

51. Which of the vessels above is a lymph vein?

- A. W
- B. X
- C. Y
- D. Z

Use the following diagram to answer question 52.



52. The blood cells shown in the diagram above function to

- A. clot the blood.
- B. fight infection.
- C. buffer the blood.
- D. transport oxygen.

53. A foreign substance that stimulates an immune response is a(n)

- A. cancer.
- B. antigen.
- C. antibody.
- D. promoter.

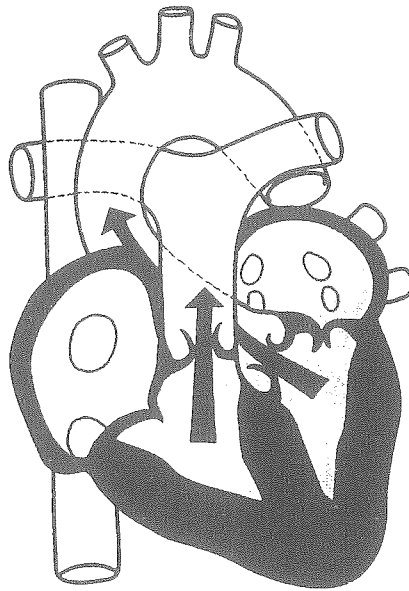
54. The path followed by blood on one circuit through the heart is

- A. ventricle, atrioventricular valve, semilunar valve, atrium.
- B. atrium, atrioventricular valve, ventricle, semilunar valve.
- C. atrium, ventricle, atrioventricular valve, semilunar valve.
- D. atrium, semilunar valve, ventricle, atrioventricular valve.

55. A condition called tachycardia exists when a person's heartrate is abnormally high. Which of the following explains how tachycardia may arise?

- A. The Purkinje fibres are over-stimulating the pacemaker.
- B. The sinoatrial (SA) node is receiving increased stimulation.
- C. There is increased stimulation by the parasympathetic nervous system.
- D. Impulses from the sinoatrial (SA) node are not reaching the atrioventricular (AV) node.

Use the following diagram to answer question 56.



56. The heart shown above is in the process of

- A. atrial and ventricular systole.
- B. atrial and ventricular diastole.
- C. atrial systole and ventricular diastole.
- D. atrial diastole and ventricular systole.

57. The normal 120/80 blood pressure reading is a measurement of

- A. atrial systole and ventricular systole.
- B. ventricular diastole and atrial systole.
- C. atrial diastole and ventricular diastole.
- D. ventricular systole and ventricular diastole.

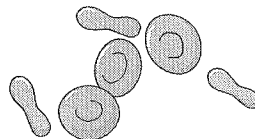
58. The fetal blood vessel that joins the aorta and the pulmonary artery and normally closes at birth is the
- arterial duct.
 - venous duct.
 - oval opening.
 - umbilical artery.

Use the following information to answer question 59.

Blood Vessel	Pressure mm Hg	Velocity cm/sec.
W	80	50
X	less than 5	35
Y	60	20
Z	20	2

59. What is the correct sequence of blood vessels that a red blood cell passes through while travelling from the left ventricle to the right atrium?
- W → Y → X → Z
 - W → Y → Z → X
 - Y → Z → X → W
 - Y → Z → W → X

Use the following diagram to answer question 60.



60. The function of the blood cells shown is to
- carry oxygen.
 - fight infection.
 - produce lymphocytes.
 - initiate blood clotting.
61. Contraction of the right atrium forces blood through
- a semi-lunar valve into the aorta.
 - an AV valve into the right ventricle.
 - an AV valve into the pulmonary artery.
 - a semi-lunar valve into the posterior vena cava.

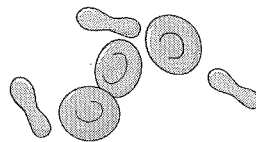
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59. What is the correct sequence of blood vessels that a red blood cell passes through while travelling from the left ventricle to the right atrium?
- W → Y → X → Z
 - W → Y → Z → X
 - Y → Z → X → W
 - Y → Z → W → X

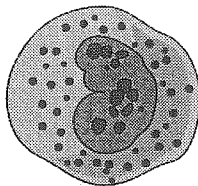
Use the following diagram to answer question 60.



60. The function of the blood cells shown is to
- carry oxygen.
 - fight infection.
 - produce lymphocytes.
 - initiate blood clotting.
61. Contraction of the right atrium forces blood through
- a semi-lunar valve into the aorta.
 - an AV valve into the right ventricle.
 - an AV valve into the pulmonary artery.
 - a semi-lunar valve into the posterior vena cava.

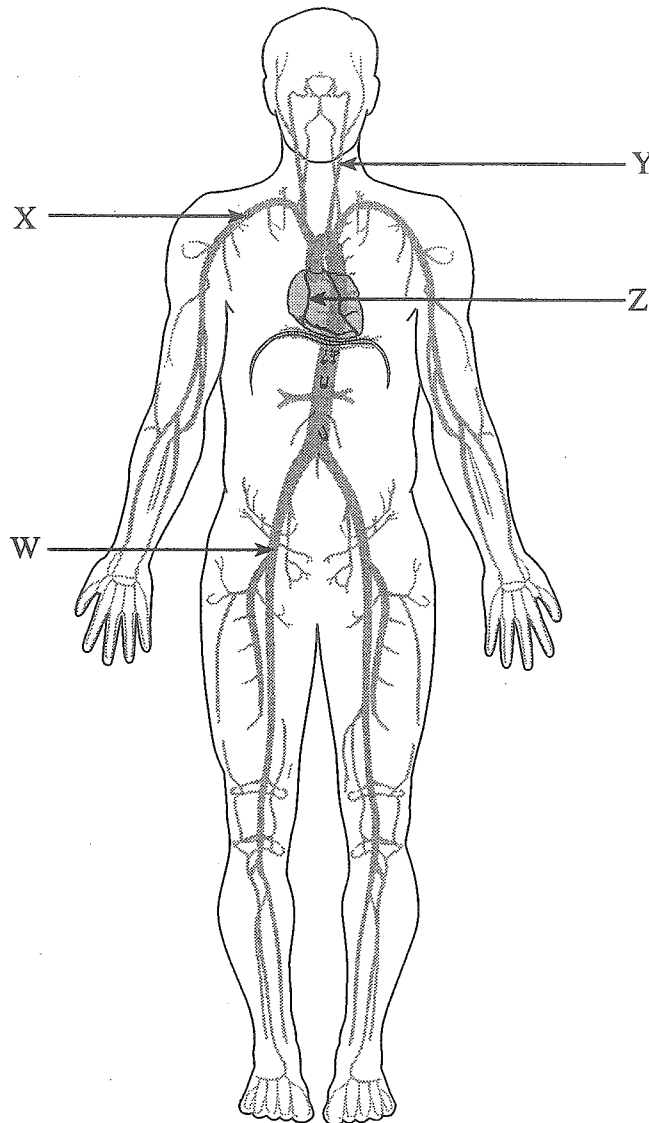
62. The pulmonary artery is classified as an artery because it
- A. has thin walls.
 - B. carries blood away from the heart.
 - C. contains blood that has high levels of oxygen.
 - D. has one-way valves that prevent blood from flowing back to the heart.
63. In which of the following vessels would blood plasma be the most hypertonic to distilled water?
- A. renal vein
 - B. carotid artery
 - C. subclavian artery
 - D. hepatic portal vein
64. What would result if a blockage occurred in a lymph vein?
- A. More lymph would enter the subclavian vein.
 - B. The tissue served by this lymph vein would fill with fluid.
 - C. The lymph capillaries attached to this lymph vein would dry up.
 - D. All lymph veins in this part of the body would fill up with blood.

Use the following diagram to answer question 65.



65. Which of the following components of blood is represented by the diagram?
- A. a platelet
 - B. fibrinogen
 - C. a red blood cell
 - D. a white blood cell
66. Blood plasma leaves and re-enters the circulatory system by
- A. active transport.
 - B. pressure filtration.
 - C. selective reabsorption.
 - D. capillary-tissue fluid exchange.

Use the following diagram to answer question 67.



67. Which letter indicates the carotid artery?

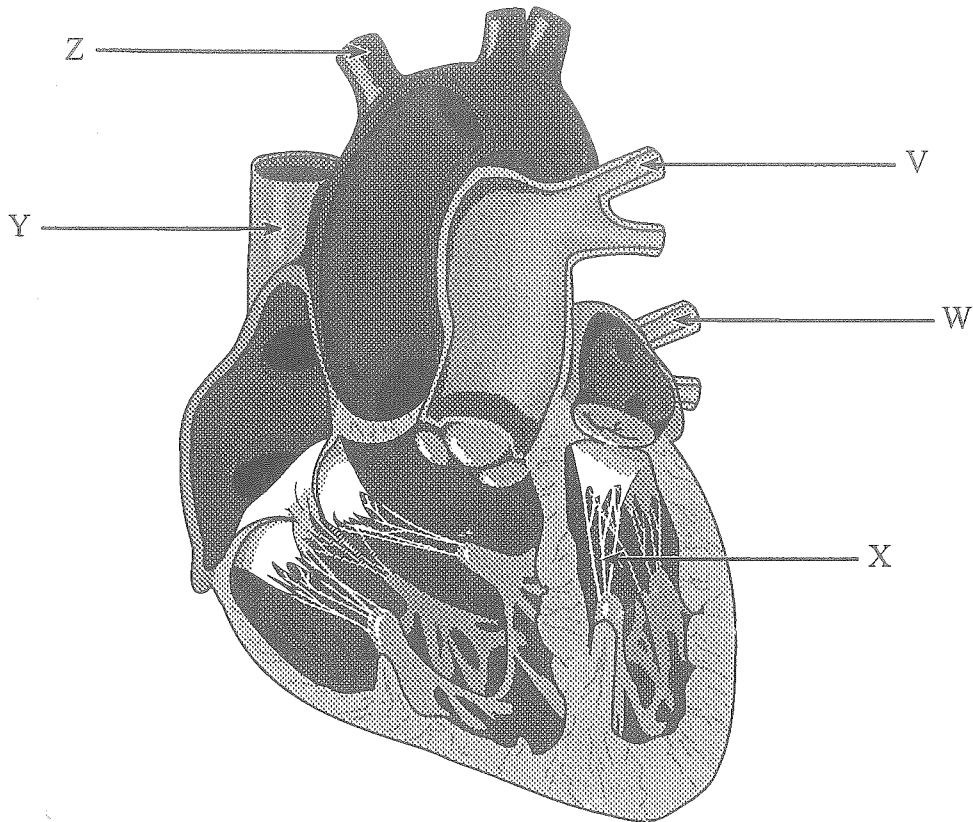
- A. W
- B. X
- C. Y
- D. Z

68. Which of the following blood vessels have thin, permeable walls?

- A. veins
- B. venules
- C. arterioles
- D. capillaries

OVER

Use the following diagram to answer questions 69 and 70



69. The function of the structure labelled X is to
- A. initiate heartbeat.
 - B. channel blood to the ventricles.
 - C. carry blood to the heart muscle.
 - D. prevent the valves from inverting.

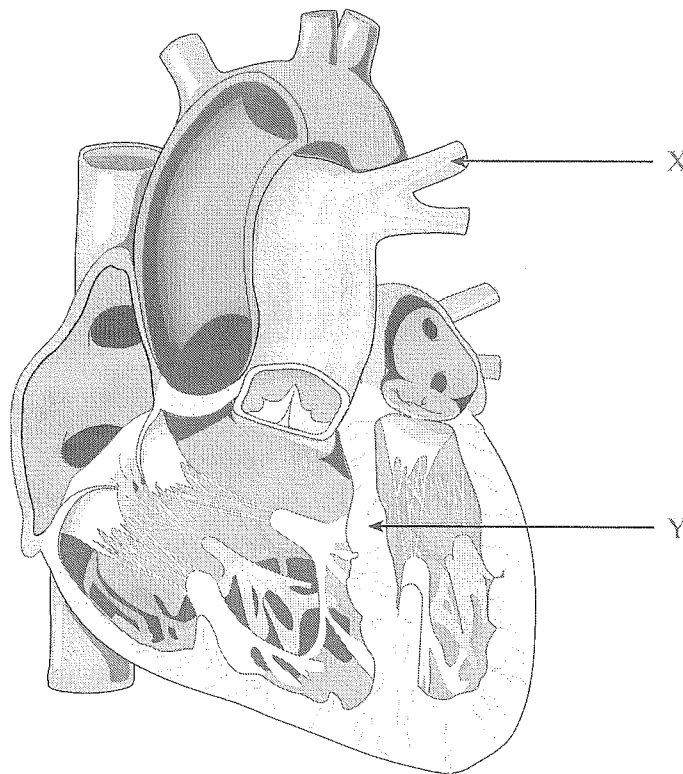
70. The anterior (superior) vena cava is labelled

- A. V
- B. W
- C. Y
- D. Z

71. The vessel that returns blood that is low in oxygen to the heart is the

- A. coronary artery.
- B. pulmonary vein.
- C. pulmonary artery.
- D. anterior (superior) vena cava.

Use the following diagram to answer questions 72 and 73



72 Structure X carries blood to the

- A. lungs.
- B. heart tissue.
- C. lower body.
- D. upper body.

73 Structure Y is the

- A. septum.
- B. right ventricle.
- C. coronary artery.
- D. chordae tendineae.

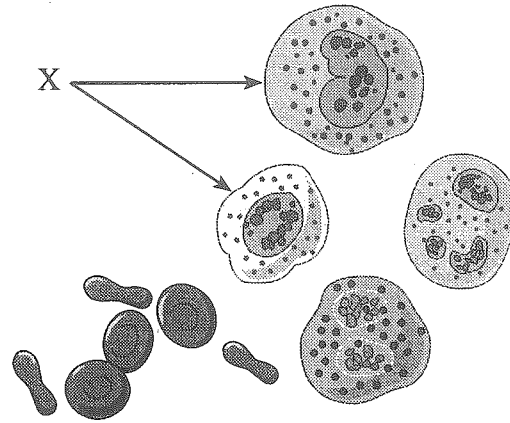
74 Blood vessels that allow diffusion of gases through their thin walls are the

- A. arteries.
- B. venules.
- C. arterioles.
- D. capillaries.

75 The blood vessel that carries blood from the lungs to the heart is the

- A. coronary vein.
- B. coronary artery.
- C. pulmonary vein.
- D. pulmonary artery.

Use the following diagram to answer question 76



76 The structures labelled X are

- A. platelets.
- B. antibodies.
- C. red blood cells.
- D. white blood cells.

Use the following characteristics to answer question 77

- one-way valves
- thin elastic layer
- near skeletal muscle

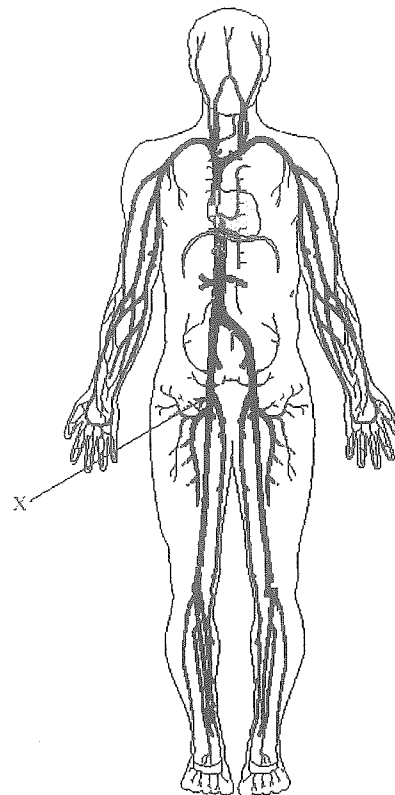
77 The characteristics above describe which type of vessel?

- A. vein
- B. artery
- C. arteriole
- D. capillary

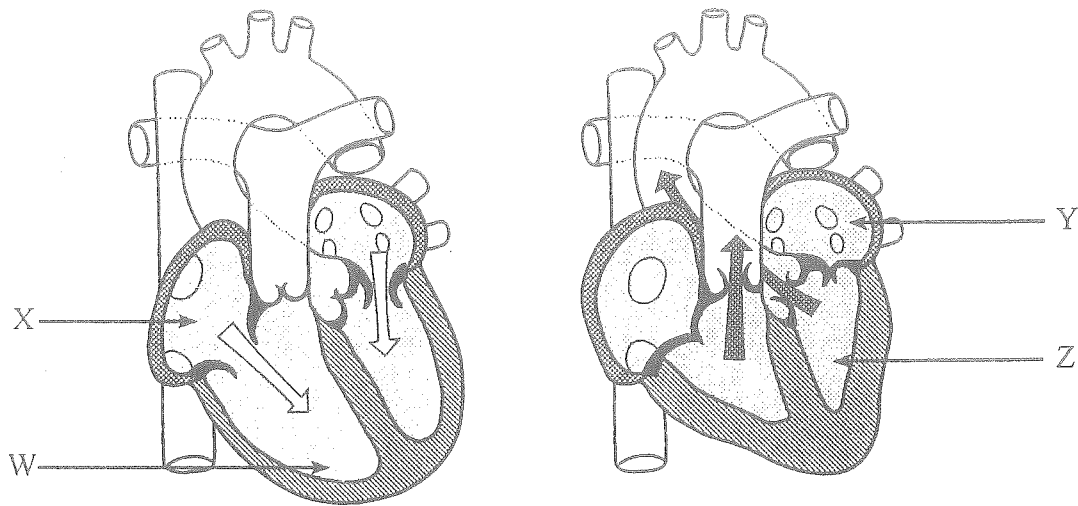
Use the following diagram to answer question 78

78 The structure labelled X is the

- A. iliac vein.
- B. renal vein.
- C. subclavian vein.
- D. posterior vena cava.



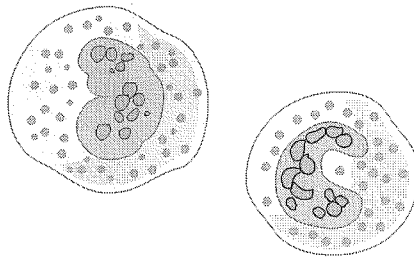
Use the following diagram to answer question 79



79 Systole of the ventricles is occurring at

- A. W
- B. X
- C. Y
- D. Z

Use the following diagram to answer question 80



80 The cells above

- A. carry oxygen in the blood.
- B. exchange gases in the lungs.
- C. are active in areas of infection.
- D. begin the process of blood clotting.

81 The substance produced by the body in response to a foreign substance is

- A. an antigen.
- B. a hormone.
- C. an enzyme.
- D. an antibody.

82 What happens during atrial diastole?

- A. Atria fill with blood.
- B. Semi-lunar valves close.
- C. Ventricles fill with blood.
- D. Atrioventricular valves open.

83 A blood vessel that transports blood out of a capillary bed is a(n)

- A. vein.
- B. artery.
- C. venule.
- D. arteriole.

84 The atrioventricular (AV) node stimulates the

- A. aorta.
- B. Purkinje fibers.
- C. sinoatrial (SA) node.
- D. atrioventricular valves.

85 Which of the following is normal resting systolic blood pressure for an adult?

- A. 50 mm Hg
- B. 80 mm Hg
- C. 120 mm Hg
- D. 180 mm Hg

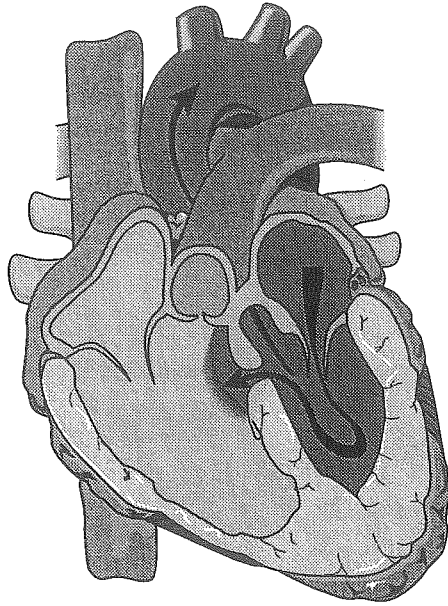
Use the following information to answer question 86

BLOOD VESSEL	PRESSURE (mm of mercury)	VELOCITY (cm/sec.)
S	less than 5	15
T	20	80
U	10	2
V	40	100

86. Blood vessel U is a(n)

- A. vein.
- B. artery.
- C. venule.
- D. capillary.

Use the following diagram to answer question 87



87 The diagram shows a heart defect that occurs approximately once in every 500 births. Babies born with this defect have

- A. a lower than normal heart rate.
 - B. a decreased production of red blood cells.
 - C. difficulty closing the atria-ventricular valves.
 - D. oxygenated and deoxygenated blood mixed together.
-

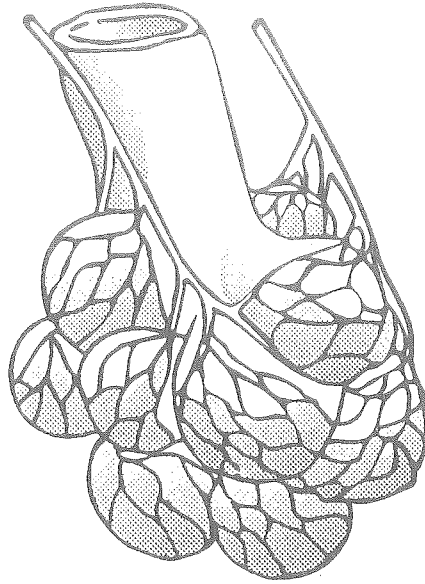
88 How many heart valves would a blood cell travelling from the renal vein to the pulmonary vein pass through?

- A. none
- B. one
- C. two
- D. four

89 The chordae tendineae function to

- A. give support to the septum.
- B. open the semi-lunar valves.
- C. open the atrioventricular valves.
- D. prevent valves in the heart from inverting.

Use the following diagram to answer question 90

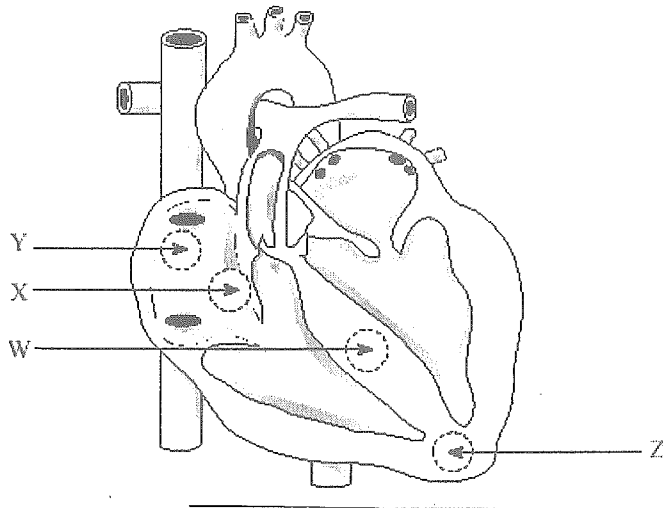


90 Which of the following substances would be found at its highest concentration in blood leaving the capillaries shown in the diagram?

- A. Oxyhemoglobin.
- B. Bicarbonate ions.
- C. Reduced hemoglobin.
- D. Carbaminohemoglobin.

Use the following diagram to answer question 91

91 Which area indicated in the diagram is the location of the AV node?



- A. W
- B. X
- C. Y
- D. Z

92 Which of the following is normally found in blood plasma but **not** in lymph?

- A. salt
- B. urea
- C. oxygen
- D. platelets

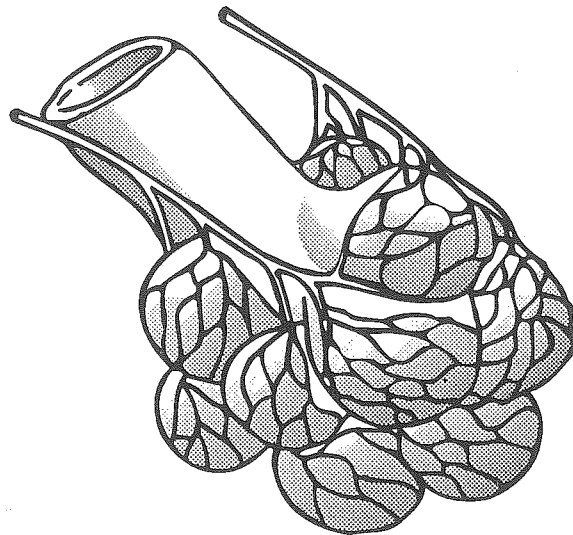
93. Most hemoglobin becomes reduced inside a(n)

- A. artery.
- B. venule.
- C. arteriole.
- D. capillary.

94. In fetal circulation, blood from the placenta enters the posterior vena cava by way of the

- A. umbilical artery.
- B. ductus venosus (venous duct).
- C. foramen ovale (oval opening).
- D. ductus arteriosus (arterial duct).

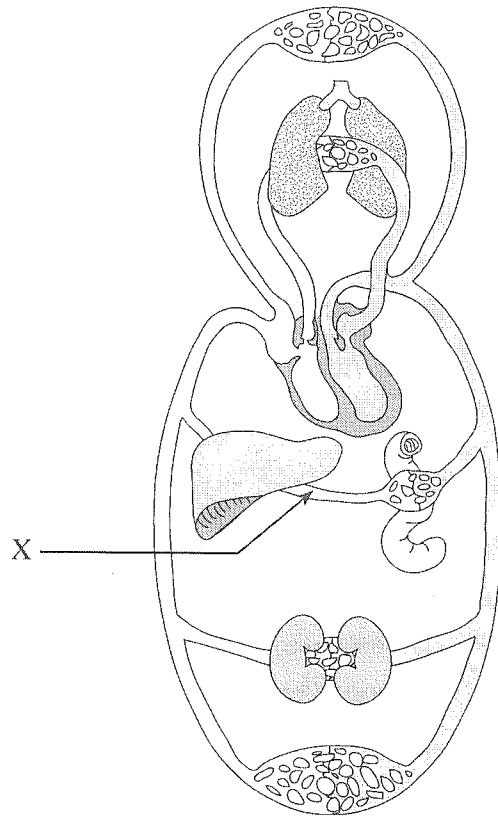
Use the following diagram to answer question 95.



95. What happens in the tissues of this structure as a result of a lower than normal concentration of plasma proteins in the blood?

- A. Fluid is lost from the tissues due to a decrease in blood pressure.
- B. Fluid is lost from the tissues due to a decrease in osmotic pressure.
- C. Fluid accumulates in the tissues due to a decrease in blood pressure.
- D. Fluid accumulates in the tissues due to a decrease in osmotic pressure.

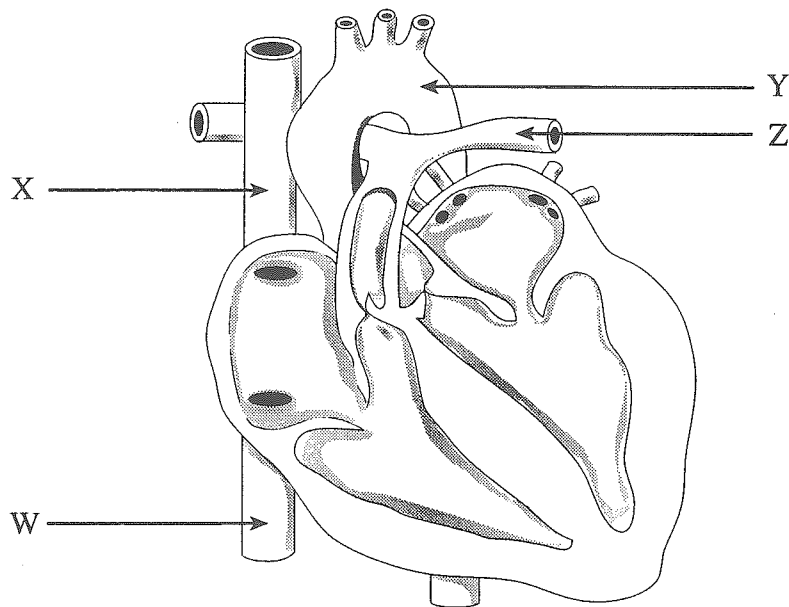
Use the following diagram to answer question 96



96 The vessel labelled X is the

- A. aorta.
- B. renal vein.
- C. hepatic vein.
- D. hepatic portal vein.

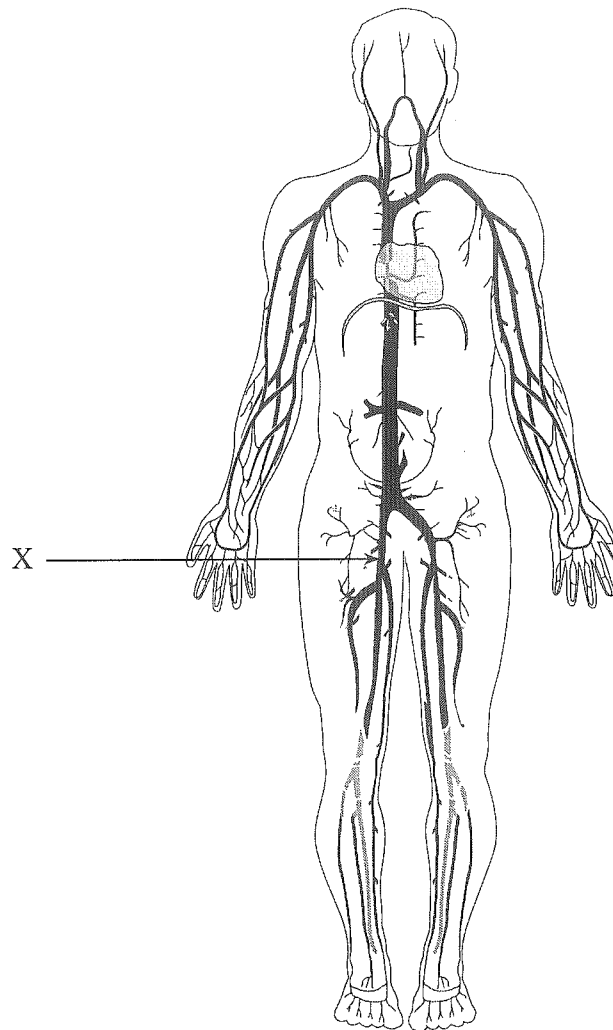
Use the following diagram to answer question 97



97 Blood pressure is greatest in which of the labelled vessels?

- A. W
- B. X
- C. Y
- D. Z

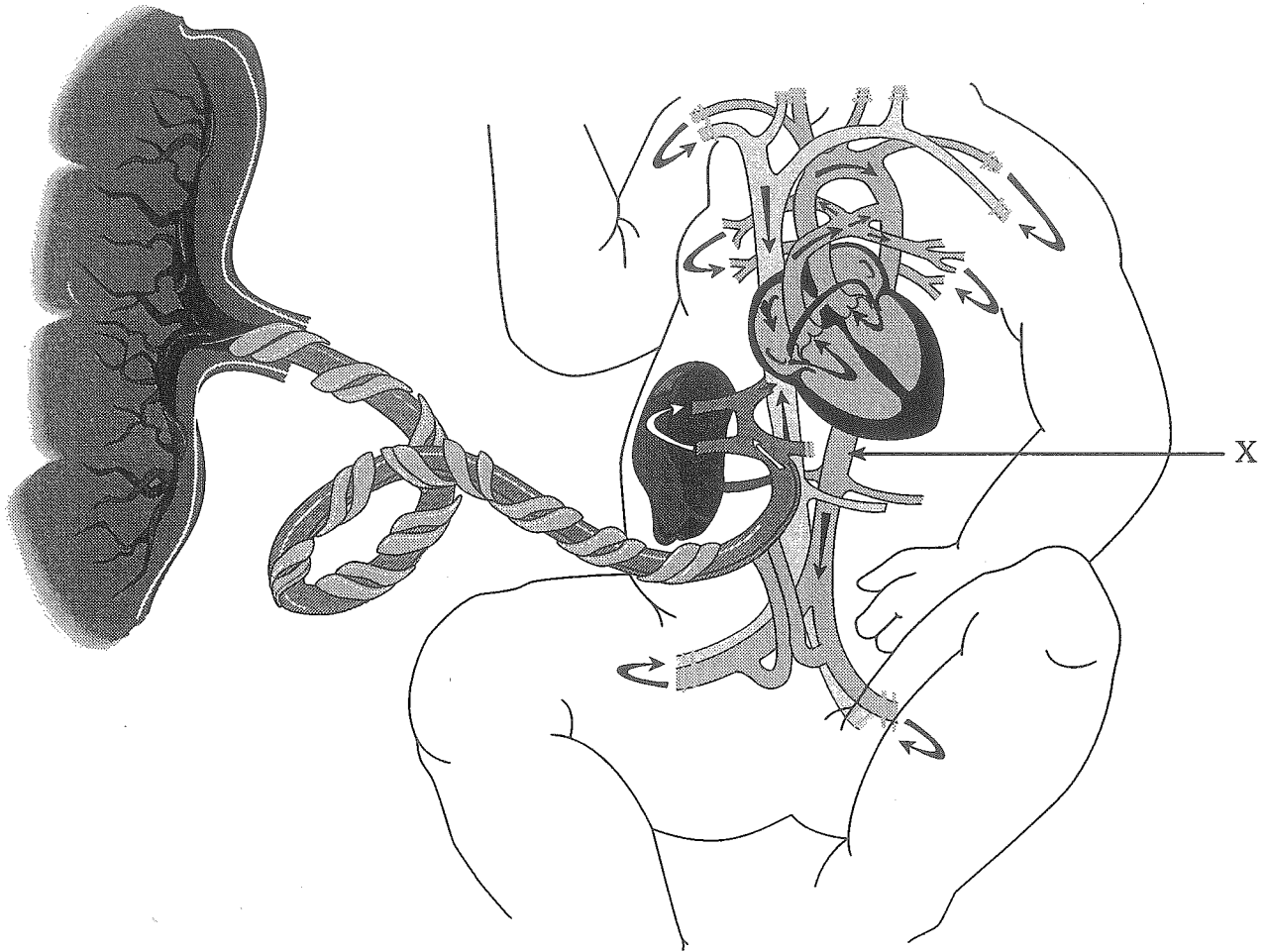
Use the following diagram to answer question 98



98 The blood vessel labelled X is the

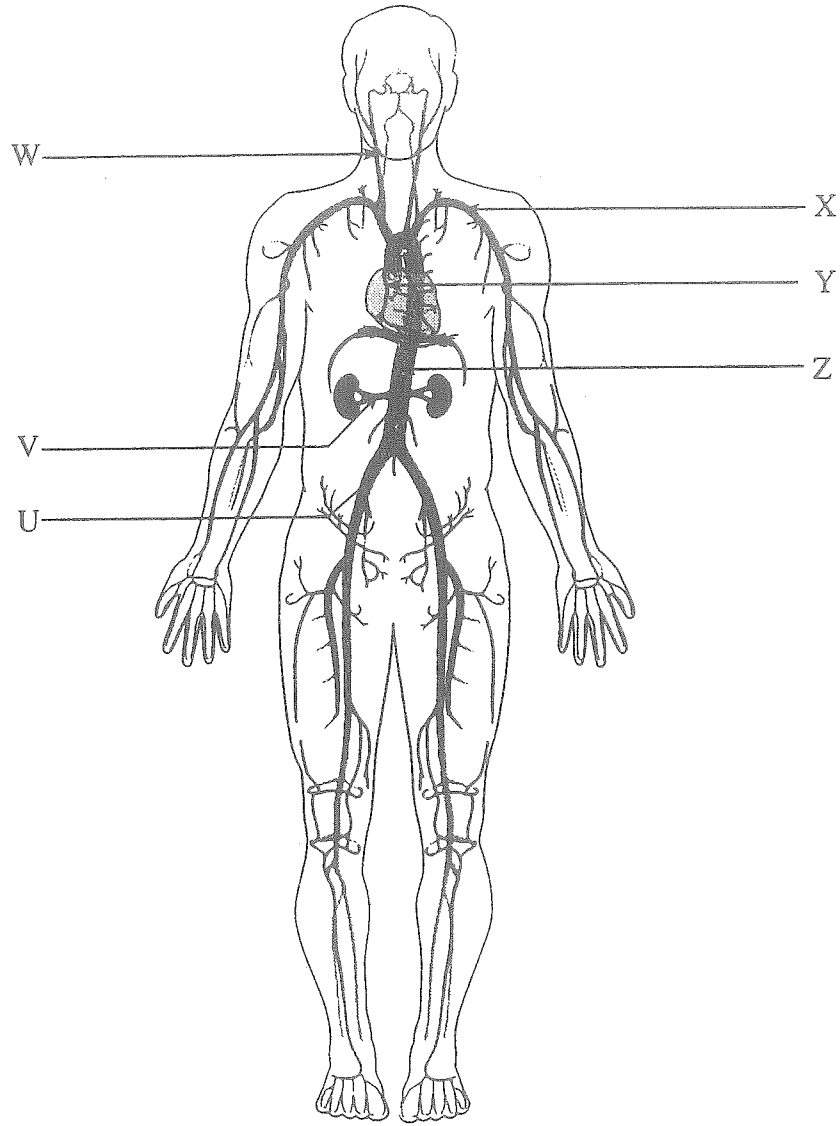
- A. aorta.
- B. iliac vein.
- C. subclavian vein.
- D. anterior vena cava.

Use the following diagram to answer question 99



- 99 The blood vessel labelled X is the
- A. aorta.
 - B. ductus venosus (venus duct).
 - C. foramen ovale (oval opening).
 - D. ductus arteriosus (arterial duct).

Use the following diagram to answer question(100).



(100) a) For each blood vessel listed in the table below, write the letter from the diagram which indicates the vessel's location. (2 marks: $\frac{1}{2}$ mark each)

BLOOD VESSEL	LETTER FROM DIAGRAM
Iliac artery	
Aorta	
Carotid artery	
Subclavian artery	

- b) In the table below, contrast the structure and/or function of the hepatic vein versus the hepatic portal vein. (4 marks)

	HEPATIC VEIN	HEPATIC PORTAL VEIN
CONTRAST 1		
CONTRAST 2		

- c) Name two structures present in fetal but not in adult circulatory systems and describe the function of each. (4 marks: 1 mark each for name; 1 mark each for function)

Name: _____

Function: _____

Name: _____

Function: _____

101 Describe the concentration of dissolved gases in the following pairs of vessels and explain why the concentrations are different.

pulmonary vein / pulmonary artery:

(2 marks)

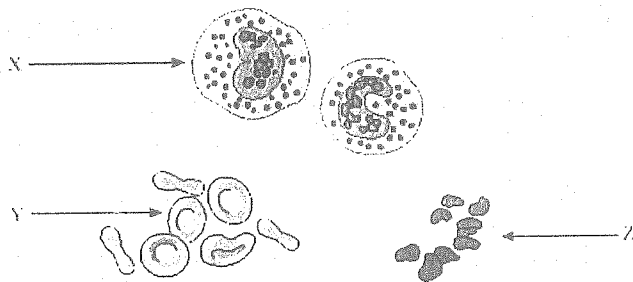
posterior vena cava / aorta:

(2 marks)

umbilical vein / umbilical artery:

(2 marks)

102. Identify each blood component indicated in the diagram below and give one function of each. (6 marks: 1 mark each for name and 1 mark each for function)



Component X: _____
Function: _____
Component Y: _____
Function: _____
Component Z: _____
Function: _____

103 Explain how the structure of arteries is related to their function.

(2 marks)

104 How does the circulatory system respond to each of the following?

an antigen enters the blood:

(2 marks)

increased stimulation by the sympathetic nervous system:

(2 marks)

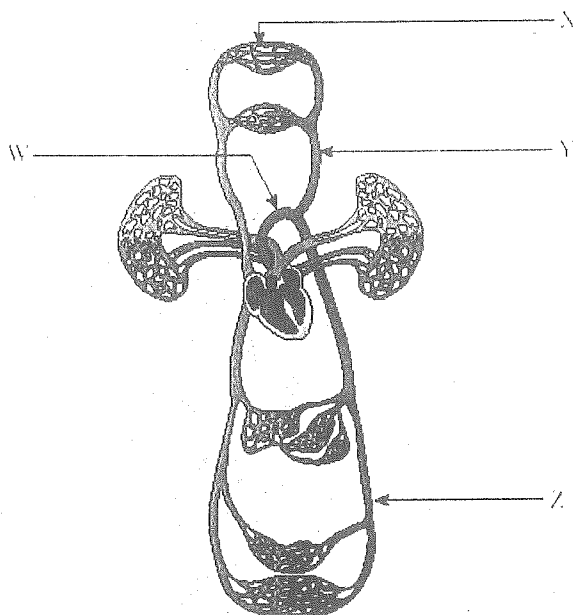
hardening of the arteries (inability of arteries to expand and recoil):

(1 mark)

a cut on your finger:

(1 mark)

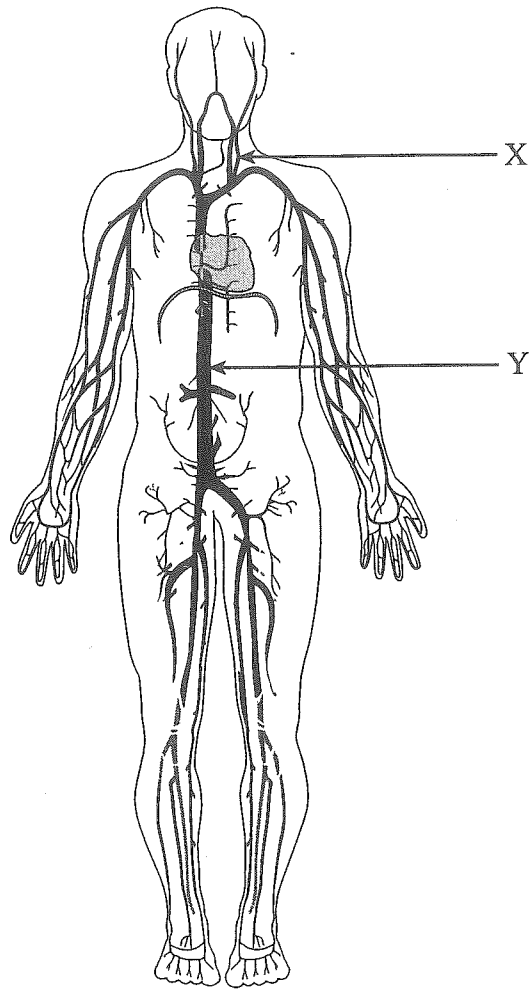
Use the following diagram to answer question 105



105 The blood pressure in the vessels in the diagram above would be highest at

- A. W
- B. X
- C. Y
- D. Z

Use the following diagram to answer question 106



106 a) Identify each of the labelled veins and give one function of each.
(4 marks: 1 mark each for name; 1 mark each for function)

Vein X:

Name: _____

Function: _____

Vein Y:

Name: _____

Function: _____

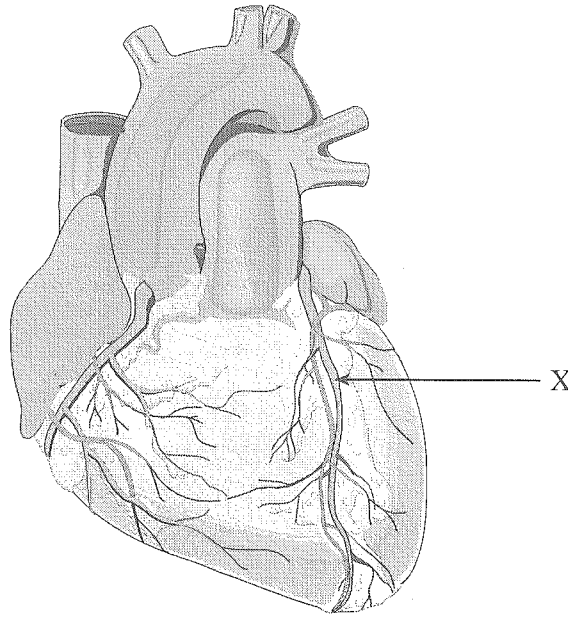
- b) i) Give the location of the oval opening (foramen ovale) in the circulatory system of the fetus and state its function. (2 marks: 1 mark for location; 1 mark for function)

Location: _____

Function: _____

- ii) Describe what would occur if the oval opening (foramen ovale) failed to close at birth. (1 mark)

Use the following diagram to answer question 107a).



107 a) Describe **three** things that would occur if the artery labelled X became blocked? (3 marks)

i) _____

ii) _____

iii) _____

b) What would happen if the atrioventricular (AV) valve in the left side of the heart did **not** close properly? (2 marks)

108 Describe how the structure of each of the following aids in its function. (3 marks)

Artery: _____

Semi-lunar valve: _____

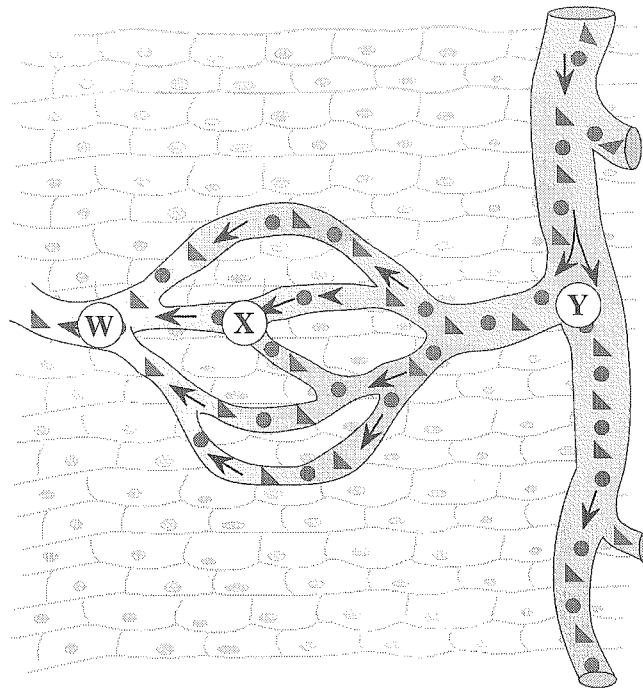
Capillary: _____

109. Complete the following chart that describes the composition of blood.

(6 marks: 1 mark each)

PART OF THE BLOOD	COMPONENT NAME	SOURCE	FUNCTION
plasma	water		maintaining blood volume
plasma		liver	<ul style="list-style-type: none">• maintaining blood volume, pressure and pH• clotting
formed elements	platelets	bone marrow	
formed elements			fighting infection
plasma	glucose	absorbed by intestinal villi	

Use the following diagram to answer question 110



110 The diagram represents the capillary bed of a villus in the small intestine.

a) Identify vessel Y: (1 mark)

b) Describe **four** ways in which the composition of the blood at point X changes, two to three hours after eating a meal. (4 marks)

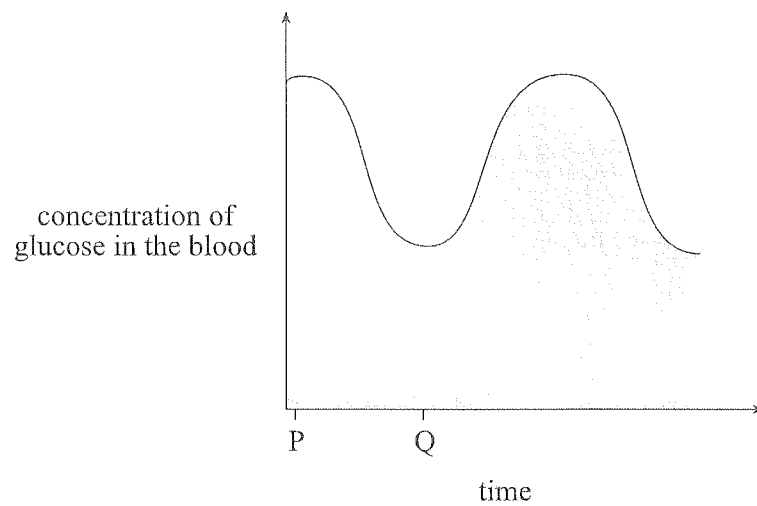
i) _____

ii) _____

iii) _____

iv) _____

c) The following is a graph of glucose concentration in vessel W over time.



Explain the observed changes in the glucose concentration between time P and time Q. (3 marks)

111. a) The average resting blood pressures and blood velocities were measured in various blood vessels of an individual as shown in the table below. Identify the type of blood vessel in the space provided. **(5 marks)**

BLOOD VESSEL	AVERAGE BLOOD VELOCITY (cm/s)	AVERAGE BLOOD PRESSURE (mm Hg)	TYPE OF BLOOD VESSEL
A	48.0	100	
B	0.5	22	
C	15.0	60	
D	25.0	2	
E	4.0	10	

- b) Explain the observed blood pressure and velocity in the following vessels.

Vessel A:

(2 marks)

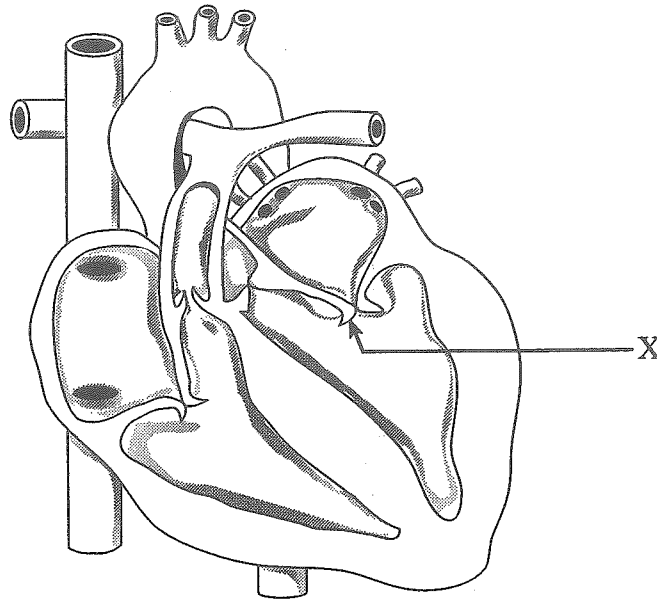
Vessel B:

(2 marks)

- c) How does the sympathetic nervous system raise blood pressure?

(1 mark)

Use the following diagram to answer question 112.



112 The structure labelled X will open when which of the following is contracting?

- A. atria
- B. aorta
- C. ventricles
- D. sino-atrial (SA) node

113 a) Describe **one** function of each of the following.

(3 marks)

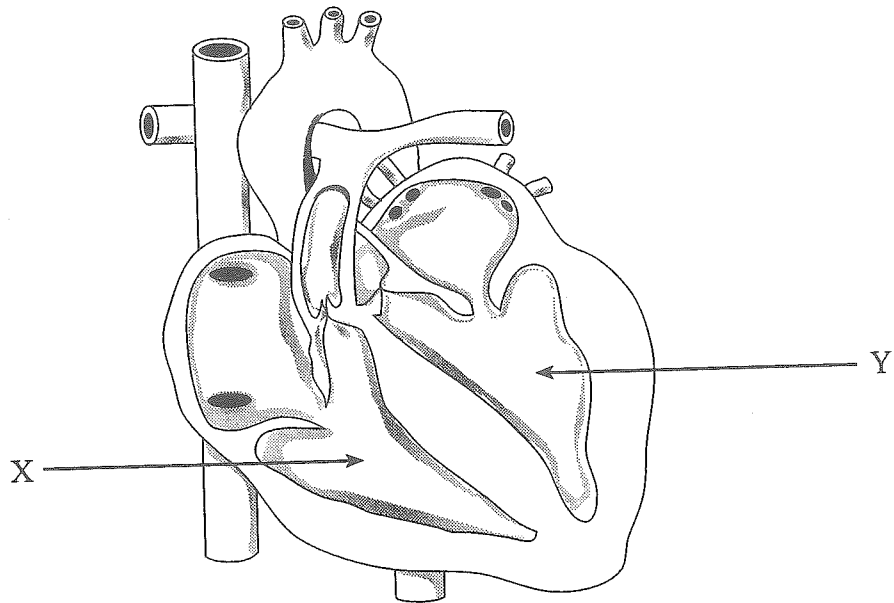
Red blood cells:

White blood cells:

Platelets:

b) Where are red blood cells produced?

(1 mark)



114 a) Compare the composition of the blood in structures X and Y. (2 marks)

Structure X: _____

Structure Y: _____

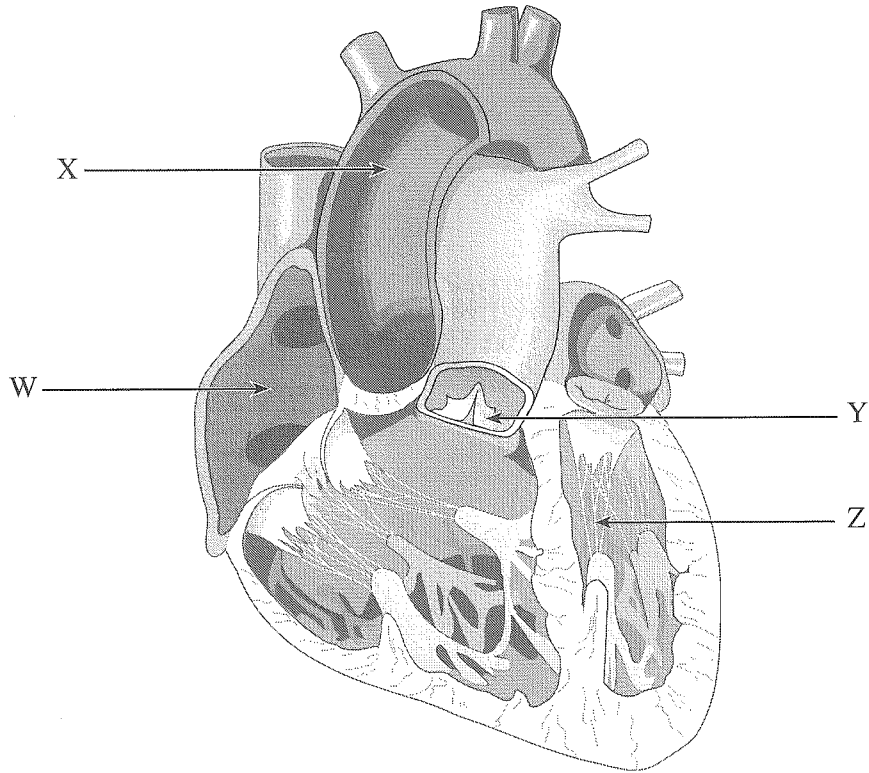
b) Relate the difference in the structure of X and Y to their functions. (2 marks)

115. When people are involved in an exercise program, changes in the circulatory system occur.

a) Explain why the number of capillaries in the skeletal muscle tissue increases. (2 marks)

b) Explain why the maximum heart rate is lower for the same amount of exercise. (2 marks)

Use the following diagram to answer question 116



116 Identify and give **one** function of each of the following structures.
(8 marks: 1 mark each for name; 1 mark each for function)

Structure **W**:

Name: _____

Function: _____

Structure **X**:

Name: _____

Function: _____

Structure Y:

Name: _____

Function: _____

Structure Z:

Name: _____

Function: _____

117 Complete the following table describing components of the blood. (6 marks: 1 mark each)

	Red Blood Cells	Platelets
Structural Description		
Function		
Site of Production		